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Philadelphia Suburban Water Company

762 Lancaster Avenue, Bryn Mawr, Pennsylvania 19010 215/LA5-1400

June 8, 1988

Ms. Gerallyn Downes-Valls
Environmental Protection Agency
3HW12
841 Chestnut Street
Philadelphia, PA 19107

Dear Ms. Downes-Valls:

Thank you for providing us with a copy of the RIFS report and appendices for the Henderson Road Injection Well Site, and for meeting with us on June 3 to discuss our position on the proposed plan of action and the substance of the RIFS report. Enclosed are the written comments which we reviewed with you on June 3. Also, pursuant to your request at that meeting, we are submitting estimates for the capital and operating costs of the treatment systems which Philadelphia Suburban Water Company has installed and plans to install at our Upper Merion Treatment Plant to deal with the contamination originating from the subject site. The costs for the aeration tower do not include any of the costs for the initial site investigation, pilot studies and preliminary design work, for which PSWC would also expect to be reimbursed. Our accounting department is presently compiling a summary of these costs. The actual capital costs and the operating costs should be quite accurate, as they are based on our accounting records and actual operating records for the towers. The capital cost estimates for the powdered activated carbon system are based on scaling down of an estimate recently prepared for a very similar system designed for another one of our facilities. The estimate appears to be consistent with an estimate based on EPA's cost estimating guide for water treatment processes, when adjusted to 1988 dollars. The O&M costs were estimated roughly from the EPA guide. The cost of carbon is based on our last purchase of identical material. We have found the carbon specified to be the most cost-effective for other water treatment applications, but pilot work would be required at the UMR before making a final selection of product and a more accurate estimate of cost.

I have also reviewed the letters and reports you gave us on June 3 which contain comments and recommendations by CDM on the RIFS. These reports address some of the concerns which we raise about the RIFS: the inadequate characterization and quantification of wastes disposed of at the site; inadequate site investigation downgradient along the strike of the geologic formations; the need to investigate off-site migration of contaminants; and a recommendation to reopen the injection well. Some of the investigative techniques suggested by CDM are quite sophisticated and might yield valuable information. However, we cannot agree with the thrust of the CDM reports -- i.e. that about $1.5 million more must be spent on additional site investigation and pilot work before any full-scale remediation is undertaken. With the injection well not yet properly addressed, and with wells like HR-2-195 on the site with non-aqueous phase liquid (NAPL) on the water table, I believe there are actions which can and should be taken immediately to substantially lower the threat of further groundwater contamination from this site.

This brings us back to our most important concern-- effective full-scale treatment of off-site contamination from this site has been implemented for five years by Philadelphia Suburban Water Company. Additional treatment is being planned for construction in 1991. Based on a reasonable Endangerment Assessment model, these actions did and will result in the largest and most cost-effective reductions in total risk associated with any action identified in the RIFS. We have not yet been furnished a consistent argument, legal precedent, or specific citations of formal or informal EPA policy to justify failing to require re-imbursement of these costs as a component of a consent decree with the PRPs. This would be consistent with treatment of the McIlvain well, and consistent with the role which the RIFS recognizes our treatment facilities play in the ultimate remediation of this site.

I trust that EPA will fully and thoughtfully address all of the issues which we have raised in our correspondence and meeting with you.

Sincerely,

Preston Luitweiler

Preston Luitweiler
Research Engineer

COST SUMMARY FOR AERATION TOWERS -- UPPER MERION TREATMENT PLANT

CAPITAL COST:

Treatment system	$761,626
Building	77,130
Electrical and pumping equipment	106,731
TOTAL	$945,487

OPERATING AND MAINTENANCE COSTS PER YEAR

Electrical Power -- Blowers 30 kw x 14800 running hours/year x $.0622	$27,600
Electrical-Pumping $\frac{30' \text{ head} \times 4566 \text{ gpm} \times .746 \text{ kw/hp} \times 8760 \text{ hr/yr} \times \$.0622/\text{kwh}}{3960 \text{ gpm-ft/hp} \times 75\% \text{ eff}} =$	18,750
Air Filters	2,200
Heat and building electric (estimate)	2,700
Equipment maintenance and replacement reserve (estimate)	12,500
TOTAL	$63,750/year

O&M EXPENSES INCURRED TO DATE (estimated; without interest)

$63,750/year x 5 years = $318,750

COST ESTIMATE FOR POWDERED ACTIVATED CARBON FEED SYSTEM

Design assumptions: liquid slurry system -- bulk handling
carbon -- Westvaco sugar grade
maximum feed rate 56 lb/hr
average feed rate 7.5 lb/hr

CAPITAL COST

Building and pits	$285,000
Purchased equipment	236,000
TOTAL	$521,000

OPERATING AND MAINTENANCE COSTS

Electric, maintenance, labor	$ 37,500
Carbon @ $0.69/lb	45,300
TOTAL	$ 82,800/year

WASTE REMOVAL (If sludge is classified as hazardous material)

900 cubic yards/year

NOTES ON THE RIFS AND EPA'S PLAN OF ACTION -- MAY, 1988

REMEDIAL INVESTIGATION STUDY

1. Knowledge of the composition and amount of wastes which were disposed of in the injection well is <u>essential</u> for making any kind of intelligent investigation of the site or planning any remedial action. <u>No</u> consent decree should be entered into until complete and accurate 104E forms are obtained from the PRPs. If necessary, legal action should be instituted to obtain them immediately.

2. We do not necessarily agree with the general conclusions of the Remedial Investigation Report that because concentration of site-related contaminants has not increased in the UMR in recent years, and injection of wastes was halted in 1977, then the concentrations of contaminants in the UMR are not likely to increase in the future. While this may be true, it seems equally possible that bulk contamination from the site may be migrating toward the UMR very slowly and could appear in the UMR some time in the (possibly distant) future. The estimated "travel time" of groundwater to the reservoir of 1.2 years is quite hypothetical. It may apply to the leading edge of dissolved contamination in certain individual flow paths, but cannot reasonably be applied to the centroid of a projected plot of contaminant concentration versus time.

3. We do not necessarily agree that only 3% of groundwater entering the UMR comes in contact with contamination from the subject site (p. 191). If the predominant groundwater flow in the vicinity of the site is along the strike of the geologic formations, as the groundwater contours here, and in other studies of similar formations in Chester County by USGS would indicate, and if contamination from the site has dispersed beyond the site across strike, then considerably more than 3% of the inflow to the UMR may come in contact with site contaminants.

4. The fact that the concentrations of contaminants in the UMR predicted by a simple dilution model are greater than those observed (p. 163) is most likely due to the fact that levels of dissolved contaminants found in the monitoring wells is not representative of those in all groundwater under the site. This does not necessarily mean that there is little contamination under the site, but may rather mean that the contamination is isolated in pockets (possibly very large ones) and dissolves and disperses slowly in groundwater.

5. We disagree with the conclusion (p. 165) that the Crooked Lane well site was not affected by Henderson Road contaminants. There may be other explanations for the presence of 1,2,3 TCP at Crooked Lane and its absence at Henderson Road. There is no indication that the wastes

injected at Henderson Road were homogeneous, and not enough residual waste was found to preclude the presence of 1,2,3 TCP on the site. Also, possible chemical transformations producing this chemical were not considered, nor was there any plausible explanation given for an alternative source of this compound.

6. The implication that seasonal fluctuations in TCE levels in the UMR is caused by changes in pumping rates at the UMR (p. 131) is not reasonable. Changes in pumping rate result in only relatively small changes in hydraulic gradients in the area. Furthermore, examination of the plots do not show a consistent cause and effect relationship. Rather, a more likely explanation might have to do with seasonal changes in groundwater infiltration through a contaminated vadose zone.

7. It would appear that models 9 and 13 in the Endangerment Assessment are based on the most realistic assumptions. However, they contain a hidden assumption that the duration of contamination is finite, and they do not contain any allowance for the possibility of migration of more concentrated contamination from the site to the UMR.

8. The endangerment assessment models 9 and 13 show that the most cost-effective action in reducing risk has been and will continue to be the aeration of the raw water supply by PSWC. The next most effective action would be removal of the 1,2,3 TCP, which may be accomplished by the proposed addition of PAC feed at the proposed filtration plant addition. No clean-up action at the site is likely to significantly reduce contaminant levels in the UMR in the foreseeable future, and even if it could, the cost would be hard to justify based on the avoidance of alternative costs to be incurred by PSWC treatment. Emphasis of remedial action at the site should be on preventing eventual migration of concentrated contamination to the reservoir by removing the highest concentrations of site contaminants as quickly as possible.

1. Philadelphia Suburban Water Company has been treating water from the Upper Merion reservoir for removal of contaminants (at least some of which were derived from the subject site) for five years. PSWC will likely have to continue this treatment indefinitely, regardless of what remedial steps are taken at the Henderson Road site, because of the wide dispersion of contaminants from the site and the unlikelihood of ever being able to achieve complete removal of contaminants under the site. Since PSWC's actions account for the largest share of risk reduction in the past and in the foreseeable future, there is no justification for failing to compensate PSWC for its costs associated with removal of site-related contaminants. No consent decree should be entered into which does not provide for reimbursement of PSWC's costs. We are aware of precedents for such compensation in other CERCLA settlements, and know of none to the contrary.

2. Any remedial work undertaken on the site should emphasize removal of the largest amount of contaminants in the shortest possible time. With this in mind, removal activities should have been undertaken immediately on well HR-2-195 when non-aqueous phase material was encountered. It should be in the financial self-interest of the PRPs to address this situation promptly. This well should be pumped immediately, with the non-aqueous phase material separated and disposed of and the aqueous phase treated with GAC, UV-peroxide or some similar process. The concentrations are too high to make air-stripping a viable treatment option until the non-aqueous phase has been completely removed and the dissolved contaminant concentrations decline significantly.

3. In fractured limestone, it is possible to miss a large reservoir of contamination in a void or fracture by only a few feet when placing monitoring wells. Because the volume of material injected into the well is almost certainly many times greater than the amount which can be accounted for by the findings in the Remedial Investigation Report, it is quite likely that many such pockets of concentrated contamination exist. If indeed the goal of remediation is to remove all significant contamination from the site, finding and removing these pockets should be a high priority. There is, however, some danger that in the process of drilling many exploratory wells into the trapped material, the rate of dissolution and release of contaminants from the site might increase. We do not believe that either the need for this type of intense

exploratory work or the possible consequences of such work have been adequately addressed in the present studies. That said, we are also not completely convinced that any steps to remove this material can be justified unless migration toward the UMR is demonstrated.

4. Next to direct pumping of non-aqueous phase contaminants, we believe that in situ volatilization holds the greatest promise for removing large amounts of contamination relatively quickly. We would urge that this option be implemented immediately, at least on a pilot scale. We recognize that the voids and fractures in limestone might make it impossible to maintain an adequate vacuum and could render this treatment ineffective. Flooding the ground surface in porous areas, possibly adding bentonite to the water, might be tried if this problem arises.

5. Ideally, in situ volatilization would be accompanied by a method of inducing flow of non-aqueous phase contaminant toward the vacuum extraction points. This could be accomplished by combining this method with pump-and-treat wells at the same locations as the vacuum extraction wellpoints. We recommend that such a system be implemented at the locations where the highest levels of contamination are encountered.

6. Air stripping without off-gas treatment in the vicinity of PSWC's treatment facilities should not be permitted without a dispersion model analysis to demonstrate that airborn levels of contamination at our property line would be negligible. UV-oxidation processes would avoid many of the disadvantages of air stripping and GAC adsorption for treating high levels of contamination, and should be given greater consideration by EPA.

8. Disposal of treated water presents something of a dilemma. If the water is of adequate quality for surface discharge, it would also likely be of higher quality than most downgradient groundwater. Therefore, downgradient injection of treated water should serve to provide dilution of contaminants flowing into the UMR as well as retard the flow of intervening contaminants toward the UMR by reducing the hydraulic gradient. On the other hand, if substantial amounts of contamination are still migrating toward the UMR and have passed the downgradient injection points, then injection could temporarily increase the levels of contaminants in the UMR. Personally, I would recommend using downgradient injection rather than surface disposal for the treated groundwater while reserving the option of halting injection if contaminant concentrations markedly increase in the UMR.

9. The injection well is known to be the entry point into the groundwater of <u>all</u> the contamination emanating from this particular source. The only responsible course of action is to remove the cap, drill through the plug and try to re-open the injection well, and then to pump this well hard and simultaneously apply vacuum extraction. I would be willing to wager that more contamination could be removed in this fashion in a year than by implementing pump-and-treat of low-level dissolved contamination in a dozen recovery wells over a century. Only until this well has been pumped free of contaminants should the well be sealed. Once it is sealed, any residual contamination in the pit walls and surrounding ground would have no easy path of migration, and its effect would be negligible. Cleaning or excavating the pit walls is probably an unnecessary expenditure of time and effort.

10. The primary "institutional controls" placed on the surrounding area should be directed toward the activities of the PRPs to prevent future further contamination of the site.